The Medical Fortnightly.

Issued Tenth and Twenty-fifth of Every Month by the Fortnightly Press Co.

UNDER THE EDITORIAL DIRECTION OF

FRANK PARSONS NORBURY, M. D. AND THOS. A. HOPKINS, M. D.

Secretary: CHARLES WOOD FASSETT, M. D.

A COSMOPOLITAN BIWEEKLY FOR THE GENERAL PRACTITIONER

Editorial Offices in St. Louis, Jacksonville and, St. Joseph, where specimen copies may be obtained and subscriptions will be taken.

Address all business communications to the Fortnightly Press Company.

Address all contributions and books for review to the Editors, Suite 312, Century Building, Saint Louis.

Volume XXII NOVEMBER TWENY-FIFTH Number 10

Editorial Department.

Dr. Osler's Address.

In this issue appears the masterly address delivered by Dr. William Osler before the St. Louis Medical Society, October 4th, previously commented upon in our editorials. It is our pleasure through the courtesy of Dr. Osler and the *Journal of the American Medical Association* to print in full this valuable contribution to the history of American medicine. Physicians of the Mississippi Valley should especially value this recital of the work of Beaumont, for he was of the West, but we should take pride in this one of the most scientific studies ever undertaken by an American, not only because he was of the West, and because he was an American, but because of the real intrinsic worth of the work done. We are too eager to look at the hills that are green afar off—the work of foreigners, which while excellent, is apt to lead to a lamentable disregard of what our own fellows in medicine are doing. Tinker in speaking of this trait of Americans, excuses it on the grounds—"That the Germans, French and English seem to take more pride in achievements of their countrymen than we do in America, and partly because many in our country have neglected to record and report their cases." He justly adds, "If we do not take pride in our own work we cannot fairly expect others to do so."

Osler honors Beaumont in calling him the first and greatest of American physiologists, an honor deserved as is shown in the persistence with which he worked—the painstaking notation of observations and the expense which he voluntarily maintained in order to make the most of the opportunity presented to him.

Every young man in medicine should read this address, become enthused with its spirit and learn of the notable achievement of American medicine. The true student of medicine will never lose an opportunity to read the biography of the masters in medicine, and we feel truly grateful for the privilege to present to our readers this valuable sketch of an American's work in physiology.

F. P. N.

Rush Medical College Becomes an Organic Part of the University of Chicago.

THE West is to have an endowed medical school on a footing with the great schools of the East. By an agreement entered into between the trustees of the University of Chicago and the Rush Medical College, the latter will be merged into the University and become in full relation the medical department of the University of Chicago. For the past few years the Rush Medical College "has been in affiliation," but now it is to become an integral part of this great and growing university.

The trustees of the medical college have agreed to raise $1,000,000 within eight months in order to consummate this most desirable union. This fund is to be expended in part in erecting new buildings on the campus of the university, the balance to go to endow chairs of instruction, so that every facility and opportunity will be given for the most advanced technical and practical training in medicine.

The work of instruction will be along the present lines, the first two years being given at the university on the South side of the city, in the laboratories and special buildings to be erected, while the last two years which are essentially clinical in instruction, will be conducted in the present buildings on the West side near the Cook County Hospital.

Chicago is to be congratulated on the success which followed the establishment of this great university and Rush College in particular surely, is to be congratulated upon the opportunities for advancement which have fallen to it during the past few years. The men who have recognized these opportunities and have grasped them are typical Western men, skilled in their professional work and capable, hard working students, alive to the needs of American medicine and of Western scholastic attainments; we allude to Drs. Frank Billings, Nicholas Senn and E. Fletcher Ingals. President Harper of the University of Chicago, too, is responsible for the willingness and co-operation on the part of the university to establish this medical school upon a footing equal to that of any other in the United States, and to equip it for work. Not only will the West profit by this amalgamation of "the university ideals" with American medical progressiveness, but all American institutions will feel the impulse and arrange to do better and more thorough work. F. P. N.

INVESTIGATING SMALLPOX.—The city of Cleveland, Ohio, has appropriated the sum of $4,000 to be expended in an effort to isolate the bacteria of smallpox. The investigation will be carried on under the direction of Dr. W. T. Howard, Jr., city bacteriologist.

HAVANA LEPERS.—The present leper hospital in Havana, San Lazaro, is in the heart of the city. It is reported that Dr. Bustamante has impressed upon President Palma the need of closing this lazaretto and of establishing a leper colony on one of the islands off the south coast of Cuba to remove any contingency of further exposure of the people to contagion.

The Reviewer's Table.

Books, Reprints, and Instruments for this department, should be sent to the Editors, St. Louis.

THE ROLLER BANDAGE. By William Barton Hopkins, M.D., Surgeon to Pennsylvania Hospital and to the Orthopedic Hospital and Infirmary for Nervous Diseases. With one hundred and five Illustrations. Fifth edition revised. Philadelphia: J. B. Lippincott Company. (Price $1.50.)

A familiarity with this little volume by physicians generally would greatly increase the effectiveness and beauty of bandaging and would add considerably to repute for skill. Dr. Hopkins has handled his subject in a clear, concise and attractive manner and has used illustration to good effect, making a text which is very pleasing. It is one of the best manuals on this subject.

ABBOTT'S BACTERIOLOGY. A Practical Manual of Bacteriology for Students and Physicians. By A. C. Abbott, M.D., Professor of Hygiene University of Pennsylvania. New (6th) edition revised and enlarged. In one 12mo volume of 636 pages, with 111 illustrations of which 26 are colored. Philadelphia and New York: Lea Brothers & Co. Publlishers. (Cloth $2.75 net.) Just ready.

Abbott's Bacteriology is too well known to need more than passing comment on the appearance of a new edition. The statement carries with it the assurance that all that is latest and best has been incorporated in it. This, the sixth edition, is of necessity considerably enlarged to make room for recent advances. Among other matters of great and practical interest which the volume includes are the recent findings regarding the causation of cerebro-spinal meningitis and dysentery; the lately revived investigations in tuberculosis and the discovery of the new group of micro-organisms which appear to be so closely allied to the bacillus tuberculosis; the very considerable additions that have been made to our knowledge of the mechanism of infection and immunity, etc. The continued popularity of the volume with both physicians and students is certain.

HAND-BOOK OF MEDICAL AND ORTHOPEDIC GYMNASTICS. By Anders Wide, M.D., Lecturer on Medical Gymnastics and Orthopedy in the Royal Carolean Medico-Surgical Institute and Director of the Gymnastic Orthopedic Institute, Stockholm. Octavo volume, 182 pages, profusely illustrated. New York: Funk & Wagnalls Co. (Price, $3.00, net.)

The profession throughout the world is in the midst of a period of interest in remedial measures of a non-medicinal character which may be used to advantage in connection with medical and surgical work. The work of Swedish physicians along the line of medical gymnastics has

been recognized as distinctly scientific and of more value than anything of the kind elsewhere developed, and we have frequently heard the desire expressed that a volume exploiting these maneuvres might be prepared for the American profession. Such a volume is the one we have before us, and we believe it cannot fail to have a cordial reception. Dr. Wide has a pleasing style as an author, and is evidently an enthusiast in his work, the text he gives us is easy of comprehension and taken with the generous introduction of more than ordinarily instructive illustrations makes the intelligent application of these means within the reach of any physician who will avail himself of them.

AMONG THE MAGAZINES

In what respects will the Louisiana Purchase Exposition, to be held in St. Louis a year from next spring, be an improvement on the great World's Fair at Chicago? This is a question which is of interest to every American. The progress in invention and science has been wonderful. The advance in the comprehension of harmonious architecture has been no less so. New methods have been devised for entertaining visitors of all classes. Ex-Senator John M. Thurston contributes an interesting and splendidly illustrated article, touching on all these subjects, to the November Cosmopolitan.

The November St. Nicholas must appeal especially to the boys. It contains a profusely illustrated article on "A Trip Through the New York Navy Yard" by Joseph Henry Adams. "In the Night Crew" Henry Payson Dowst presents a railroad story of thrilling interest. A young lad is called in unexpectedly to perform the duties of brakeman on a night freight, and goes through all those little adventures in which every boy has pictured himself over and over again. "Baby Elton the Quarter-Back," by Leslie W. Quirk, is a timely story of college and football, in which one of the players is suddenly afflicted with a sprained ankle "accidentally on purpose" in the middle of a game in order that "Baby Elton"' may have a chance to show his prowess. How well he acquits hiself is the interesting part of the story.

Social, economic and political topics largely dominate the Review of Reviews for November. "The Progress of the World," gives an exhaustive review of the coal strike, while Mr. Walter Wellman contributes a graphic account of the settlement of the strike as viewed at Washington, and Mr. Frank J. Warne writes of "John Mitchell: the Labor Leader and the Man." Col. Carroll D. Wright, of President Roosevelt's arbitration commission, is the subject of a character sketch by Mr. H. T. Newcomb. Mr. Charles A. Conant writes on "The Growth of Trust Companies;" Prof. J. W. Jenks on "Self-Government in Oriental Dependencies;" and Arthur Wallace Dunn on "Government in the Philippines, 1898-1902." "Shall There Be a Two Years' College Course?" is made the subject of an interview with President Butler, of Columbia, whose recent discussion of this topic in his annual report has awakened widespread interest. Dr. Albert Shaw gives a most interesting Account of "A Successful Farm Colony in the Irrigation Country"—a Salvation Army enterprise.

Original Department.

PAPERS for the Original Department should be in hand one month in advance, and contributed to THE MEDICAL FORTNIGHTLY exclusively. A liberal number of extra copies will be furnished authors, and reprints may be obtained at reasonable rates, if request accompanies the manuscript. Engravings from photographs furnished free.

Contributions, and books for review, should be sent to the Editors, 312 Century Building, St. Louis.

COLLABORATORS.

ALBERT ABRAMS, M. D., San Francisco.
LEWIS H. ADLER, Jr., M. D., Philadelphia.
M. V. BALL, M. D., Warren, Pa.
J. K. BAUDUY, M. D., St. Louis.
FRANK BILLINGS, M. D., Chicago, Ill.
A. V. L. BROKAW, M. D., St. Louis.
DILLON BROWN, M. D., New York.
HENRY T. BYFORD, M. D., Chicago.
GIVEN CAMPBELL, JR., M. D., St. Louis,
CHARLES W. BURR, M. D., Philadelphia.
C. G. CHADDOCK, M. D., St. Louis, Mo.
S. SOLIS COHEN, M. D., Philadelphia, Pa.
W. T. CORLETT, M. D., Cleveland.
ARCHIBALD CHURCH, M. D., Chicago.
N. S. DAVIS, Jr., M. D., Chicago.
ARTHUR R. EDWARDS, M. D., Chicago, Ill.
FRANK R. FRY, M. D., St. Louis.
Mr. REGINALD HARRISON, London, Eng.
RICHARD T. HEWLETT, M. D., London, Eng.
J. N. HALL, M. D., Denver.
HOBART A. HARE, M. D., Philadelphia.
CHARLES JEWETT, M. D., Brooklyn.
J. E. JENNINGS, M. D., St. Louis, Mo.
THOMAS LINN, M. D., Nice, France.
F. J. LUTZ, M. D., St. Louis.
FRANKLIN H. MARTIN, M. D., Chicago.
J. M. MATHEWS, M. D., Louisville.
E. E. MONTGOMERY, M. D., Philadelphia.
F. SAVORY PEARCE, M. D., Philadelphia,
NICHOLAS SENN, M. D., Chicago.
FERD. C. VALENTINE, M. D., New York.
EDWIN WALKER, M. D., Evansville.
REYNOLD W. WILCOX, M. D., New York.
W. E. WIRT, M. D., Cleveland.
H. M. WHELPLEY, M. D., St. Louis.
WM. H. WILDER, M. D., Chicago, Ill.

William Beaumont; a Pioneer American Physiologist.

By William Osler, M. D.

BALTIMORE,

Professor of Medicine, John Hopkins University.

An Address before the St. Louis Medical Society, October 4, 1902.

COME with me for a few moments on a lovely June day in 1822, to what were then far-off northern wilds, to the Island of Michilimacinac, where the waters of Lake Michigan and Lake Huron unite and where stands Fort Mackinac, rich in the memories of Indian and voyageur, one of the four important posts on the upper lakes in the days when the rose and the fleur-de-lys strove for the mastery of the western world. Here the noble Marquette labored for his Lord, and here beneath the chapel of St. Ignace they laid his bones to rest. Here the intrepid LaSalle, the brave Tonty and the resolute Du Luht had halted in their wild wander ings. Its palisades and block-houses had echoed the war-whoops of Ojibwas and Ottawas, of Hurons and Iroquois, and the old fort had been the scene of bloody massacres and hard-fought fights, but at the conclusion of the War of 1812, after two centuries of struggle, peace settled at last on the island. The fort was occupied by United States troops, who kept the Indians in check and did general police duty on the frontier, and the place had become a rendezvous for Indians and voyageurs in the employ of the American Fur Company. On this bright spring morning the village presented an animated scene. The annual return tide to the trading post was in full course, and the beach was thronged with canoes and batteaux laden with the pelts of the winter's hunt. Voyageurs and Indians, men, women and children, with here and there a few soldiers, made up a motley crowd.

[The editors are indebted to the Journal of the American Medical Association for the illustrations that appear in this address.]

Suddenly from the company's store there is a loud report of a gun, and amid the confusion and excitement the rumor spreads of an accident, and there is a hurrying of messengers to the barracks for a doctor. In a few minutes an alert-looking man in the uniform of a U. S. Army surgeon made his way through the crowd and was at the side of a young French Canadian who had been wounded by the discharge of a gun, and with a composure bred of an exceptional experience of such injuries prepared to make the examination. Though youthful in appearance, Surgeon Beaumont had seen much service, and at the capture of York and at the investment of Plattsburgh he had shown a coolness and bravery under fire which had won high praise from his superior officers. The man and the opportunity had met—the outcome is my story of this evening.

I. THE OPPORTUNITY—ALEXIS ST. MARTIN.

On the morning of June 6 a young French Canadian, Alexis St. Martin, was standing in the company's store, "where one of the party was holding a shotgun (not a musket), which was accidentally discharged, the whole charge entering St. Martin's body. The muzzle was not over three feet from him—I think not more than two. The wadding entered, as well as pieces of his clothing; his shirt took fire; he fell, as we supposed, dead."

"Doctor Beaumont, the surgeon of the fort, was immediately sent for and reached the wounded man in a very short time, probably three minutes. We had just gotten him on a cot and were taking off some of his clothing. After the doctor had extracted part of the shot, together with pieces of clothing, and dressed his wound carefully, Robert Stuart and others assisting, he left him, remarking: 'The man can not live thirty-six hours; I will come and see him by and by.' In two or three hours he visited him again, expressing surprise at finding him doing better than he had anticipated. The next day, after getting out more shot and clothing and cutting off ragged edges of the wound, he informed Mr. Stuart, in my presence, that he thought he would recover."*

The description of the wound has been so often quoted as reported in Beaumont's work that I give here the interesting summary which I find in a "Memorial" presented to the Senate and House of Representatives by Beaumont. "The wound was received just under the left breast and supposed, at the time, to have been mortal. A large portion of the side was blown off, the ribs fractured and openings made into the cavities of the chest and abdomen, through which protruded portions of the lungs and stomach, much lacerated and burnt, exhibiting altogether an appalling and hopeless case. The diaphragm was lacerated and a perforation made directly into the cavity of the stomach, through which food was escaping at the time your memorialist was called to his relief. His life was at first wholly despaired of, but he very unexpectedly survived the immediate effects of the wound, and necessarily continued a long time under the constant professional care and treatment of your memorialist, and, by the blessing of God, finally recovered his health and strength.

* Statement of G. G. Hubbard, an officer of the company, who was present when St. Martin was shot, quoted by Dr. J. R. Baily, of Mackinac Island, in his address on the occasion of the Beaumont Memorial Exercises, Mackinac Island, July 10, 1900. The Physician and Surgeon, December, 1900.

"At the end of about ten months the wound was partially healed, but he was still an object altogether miserable and helpless. In this situation he was declared a 'common pauper' by the civil authorities of the county, and it was resolved by them that they were not able, nor required, to provide for or support, and finally declined taking care of him, and, in pursuance of what they probably believed to be their public duty, authorized by the laws of the territory, were about to transport him in this condition, to the place of his nativity in lower Canada, a distance of more than fifteen hundred miles.

"Believing the life of St. Martin must inevitably be sacrificed if such attempt to remove him should be carried into execution at that time, your memorialist, after earnest, repeated, but unavailing, remonstrances against such a course of proceedings, resolved, as the only way to rescue St. Martin from impending misery and death, to arrest the process of transportation and prevent the consequent suffering, by taking him into his own private family, where all the care and attention were bestowed that his condition required.

"St. Martin was, at this time, as before intimated, altogether helpless and suffering under the debilitating effects of his wounds—naked and destitute of everything. In this situation your memoralist received, kept, nursed, medically and surgically treated and sustained him, at much inconvenience and expense, for nearly two years, dressing his wounds daily, and for considerable part of the time twice a day, nursed him, fed him, clothed him, lodged him and furnished him with such necessaries and comforts as his condition and suffering required.

"At the end of these two years he had come able to walk and help himself a little, though unable to provide for his own necessities. In this situation your memorialist retained St. Martin in his family for the special purpose of making physiological experiments."

In the month of May, 1825, Beaumont began the experiments. In June he was ordered to Fort Niagara, where, taking the man with him, he continued the experiments until August. He then took him to Burlington and to Plattsburgh. From the latter place St. Martin returned to Canada, without obtaining Dr. Beaumont's consent. He remained in Canada four years, worked as a voyageur, married and had two children. In 1829 Beaumont succeeded in getting track of St. Martin, and the American Fur Company engaged him and transported him to Fort Crawford on the upper Mississippi. The side and wound were in the same condition as in 1825. Experiments were continued uninterruptedly until March, 1831, when circumstances made it expedient that he should return with his family to lower Canada. Dr. Beaumont often lays stress on the physical vigor of St. Martin as showing how completely he had recovered from the wound. In November, 1832, he again engaged himself to submit to another series of experiments in Plattsburgh and Washington. The last recorded experiment is in November, 1833. In 1833 he was enrolled in the United States Army at Washington as Sergeant Alexis St. Martin, of a detachment of orderlies stationed at the War Department. He was then 28 years of age, and was five feet five inches in height. Among the papers there are two

articles of agreement, both signed by the contracting parties, one dated October 19, 1833, and the other November 7 of the same year. In the former he bound himself for a term of one year to "serve, abide and continue with the said William Beaumont, wherever he shall go or travel or reside in any part of the world his covenant servant and diligently and faithfully, etc., . . . that he, the said Alexis, will at all times during the said term when thereto directed or required by said William, submit to assist and promote by all means in his power such philosophical or medical experiments as the said William shall direct or cause to be made on or in the stomach of him, the said Alexis, either through and by means of the aperture or opening thereto in the side of him, the said Alexis, or otherwise, and will obey, suffer and comply with all reasonable and proper orders of or experiments of the said William in relation thereto and in relation to the exhibiting and showing of his said stomach and the powers and properties thereto and of the appurtenances and the powers, properties and situation and state of the contents thereof." The agreement was that he should be paid his board and lodging and $150 for the year. In the other argeement it is for two years and the remuneration $400. He was paid a certain amount of the money down.

In 1846 Beaumont sent his son Israel for Alexis, and in a letter dated August 9, 1846, his son writes from Troy: "I have just returned from Montreal, but without Alexis. Upon arriving at Berthier I found that he owned and lived on a farm about fifteen miles southwest of the village." Nothing would induce him to go.

The correspondence with Mr. Morrison in 1851 and 1852 is most voluminous, and Dr. Beaumont offered Alexis $500 for the year, with comfortable support for his family. He agreed at one time to go, but it was too late in the winter and he could not get away.

The last letter of the series is dated October 15, 1852, and is from Dr. Beaumont to Alexis, whom he addresses as *Mon Ami*. Two sentences in this are worth quoting: "Without reference to past efforts and disappointments—or expectation of ever obtaining your services again for the purpose of experiments, etc., upon the proposals and conditions heretofore made and suggested, I now proffer to you in faith and sincerity, new, and I hope satisfactory, terms and conditions to ensure your prompt and faithful compliance with my most fervent desire to have you again with me—not only for my own individual gratification, and the benefits of medical science, but also for your own and family's present good and future welfare." He concludes with, "I can say no more, Alexis—you know what I *have* done for you many years since—what I have been *trying*, and am still anxious and wishing to do with and for you—what efforts, anxieties, anticipations and disappointments I have suffered from your non-fulfillment of my expectations. Don't disappoint me more nor forfeit the bounties and blessings reserved for you."

So much interest was excited by the report of the experiments that it was suggested to Beaumont that he should take Alexis to Europe and submit him there to a more extended series of observations by skilled physiologists. Writing June 10, 1833, he says: "I shall engage him for five

or six years if he will agree, of which I expect there is no doubt. He has always been pleased with the idea of going to France. I feel much gratified at the expression of Mr. Livingston's desire that we should visit Paris, and shall duly consider the interest he takes in the subject and make the best arrangements I can to meet his views and yours," Mr. Livingston, the American minister, wrote from Paris March 18, 1834, saying that he had submitted the work to Orfila and the Academy of Sciences, which had appointed a committee to determine if additional experiments were necessary and whether it was advisable to send to America for Alexis. Nothing, I believe, ever came of this, nor, so far as I can find, did Alexis visit Paris. Other attempts were made to secure him for purposes of study. In 1840 a student of Dr. Beaumont's, George Johnson, then at the University of Pennsylvania, wrote saying that Dr. Jackson had told him of efforts made to get Alexis to London, and Dr. Gibson informed him that the Medical Society of London had raised £300 or £400 to induce St. Martin to come, and that he, Dr. Gibson, had been trying to find St. Martin for his London friends. There are letters in the same year from Dr. R. D. Thomson of London to Professor Silliman urging him to arrange that Dr. Beaumont and Alexis should visit London. In 1856 St. Martin was under the observation of Dr. Francis Gurney Smith, in Philadelphia, who reported a brief series of experiments, so far as I know the only other report made on him.*

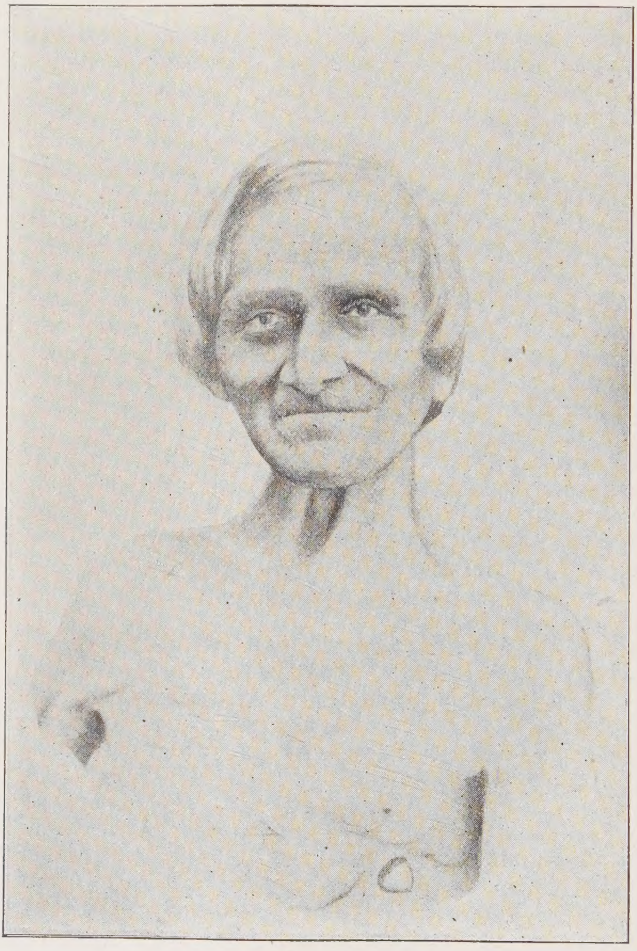
St. Martin had to stand a good deal of chaffing about the hole in his side. His comrades called him "the man with a lid on his stomach." In his memorial address Mr. C. S. Osborn of Sault Ste. Marie states that Miss Catherwood tells a story of Etienne St. Martin fighting with Charlie Charette because Charlie ridiculed his brother. Etienne stabbed him severely and swore that he would kill the whole brigade if they did not stop deriding his brother's stomach.

At one time St. Martin traveled about exhibiting the wound to physicians, medical students and before medical societies. In a copy of Beaumont's work, formerly belonging to Austin Flint, Jr., and now in the possession of a physician of St. Louis, there is a photograph of Alexis sent to Dr. Flint. There are statements made that he went to Europe, but of such a visit I can find no record.

My interest in St. Martin was of quite the general character of a teacher of physiology, who every session referred to his remarkable wound and showed Beaumont's book with the illustration. In the spring of 1880, while still a resident of Montreal, I saw a notice in the newspapers of his death at St. Thomas. I immediately wrote to a physician and to the parish priest, urging them to secure me the privilege of an autopsy and offering to pay a fair sum for the stomach, which I agreed to place in the Army Medical Museum in Washington, but without avail. Subsequently, through the kindness of the Hon. Mr. Justice Baby, I obtained the following details of St. Martin's later life, and the picture here given, which was taken the year before his death so as to show the wound, which I here show you. Judge Baby writes to his friend, Prof. D. C. MacCallum of

* Medical Examiner, 1856, and Experiments on Digestion, Philadelphia. 1836.

Montreal, as follows: "I have much pleasure today in placing in your hands such information about St. Martin as Revd. Mr. Chicoine, Cure of St. Thomas, has just handed over to me. Alexis Bidigan, *dit* St. Martin, died at St. Thomas de Joliette on the 24th of June, 1880, and was



ALEXIS ST. MARTIN, AGED 81.

buried in the cemetery of the parish on the 28th of the same month. The last sacraments of the Catholic church were ministered to him by the Revd. Cure Chicoine, who also attended at his burial service. The body was then in such an advanced stage of decomposition that it could not be admitted

into the church, but had to be left outside during the funeral service. The family resisted all requests—most pressing as they were—on the part of the members of the medical profession for an autopsy, and also kept the body at home much longer than usual and during a hot spell of weather, so as to allow decomposition to set in and baffle, as they thought, the doctors of the surrounding country and others. They had also the grave dug eight feet below the surface of the ground in order to prevent any attempt at a resurrection. When he died St. Martin was 83 years of age, and left a widow, whose maiden name was Marie Joly.

II. THE BOOK.

In the four periods in which Alexis had been under the care and study of Beaumont a large series of observations had been recorded, amounting in all to 238. A preliminary account of the case and of the first group of observations appeared in the *Philadelphia Medical Record* in January, 1825. During the stay in Washington in 1832 the great importance of the observations had become impressed on the Surgeon-General, Dr. Lovell, who seems to have acted in a most generous and kindly spirit. Beaumont tried to induce him to undertake the arrangement of the observations, but Lowell insisted that he should do the work himself. In the spring of 1833 Alexis was taken to New York and there shown to the prominent members of the profession, and careful drawings and colored sketches were made of the wound by Mr. King. A prospectus of the work was issued and was distributed by the Surgeon-General, who speaks in a letter of sending them to Dr. Franklin Bache and to Dr. Stewart of Philadelphia, and in a letter from Dr. Bache to Dr. Beaumont acknowledging the receipt of a bottle of gastric juice, Bache states that he has placed the prospectus in Mr. Judah Dobson's store and has asked for subscribers. Beaumont did not find New York a very congenial place. He complained of the difficulty of doing the work owing to the vexatious social intercourse. He applied for permission to go to Plattsburgh, in order to complete the book. After having made inquiries in New York and Philadelphia about terms of publication he decided, as the work had to be issued at his own expense, that it could be as well and much more cheaply printed at Plattsburgh, where he would also have the advice and help of his cousin, Dr. Samuel Beaumont. In a letter to the Surgeon-General, dated June 10,1833, he acknowledges the permission to go to Plattsburgh, and says: "I shall make my arrangements to leave here for Pl. in about a week to *rush* the execution of the Book as fast as possible. I am now having the drawings taken by Mr. King engraved here."

The summer was occupied in making a fresh series of experiments and getting the work in type. On December 3 he writes the Surgeon-General that the book will be ready for distribution in a few days and that 1,000 copies will be printed.

The work is an octavo volume of 280 pages, entitled "Experiments and Observations on the Gastric Juice and the Physiology of Digestion," by William Beaumont, M. D., Surgeon in the United States Army. Plattsburgh. Printed by F. P. Allen, 1833. While it is well and care-

fully printed, the paper and type are not of the best, and one can not but regret that Beaumont did not take the advice of Dr. Franklin Bache, who urged him strongly not to have the work printed at Plattsburgh, but in Philadelphia, where it could be done in very much better style. The dedication of the work to Joseph Lovell, M.D., Surgeon-General of the United States Army, acknowledges in somewhat laudatory terms the debt which Beaumont felt he owed to his chief, who very gratefully acknowledges the compliment and the kindly feeling, but characterizes the dedication as "somewhat apocryphal."

The work is divided into two main portions: first, the preliminary observations on the general physiology of digestion in seven sections: Section I, Of Ailment; Section II, Of Hunger and Thirst; Section III, Of Satisfaction and Satiety; Section IV, Of Mastication, Insalivation and Deglutition; Section V, Of Digestion by the Gastric Juice; Section VI., Of the Appearance of the Villous Coat, and of the Motions of the Stomach; Section VII, Of Chylification and Uses of the Bile and Pancreatic Juice. The greater part of the book is occupied by the larger section of the detailed account of the four series of experiments and observations. The work concludes with a series of 51 inferences from the foregoing experiments and observations.

The subsequent history of the book itself is of interest, and may be dealt with here. In 1834 copies of the Plattsburgh edition, printed by F. P. Allen, were issued by Lilly, Wait & Co., of Boston.

In the Beaumont correspondence there are many letters from a Dr. McCall, in Utica, N. Y., who was an intimate friend of a Mr. Wm. Combe, a brother of the well-known physiologist and popular writer, Dr. Andrew Combe of Edinburgh. Doubtless it was through this connection that in 1838 Dr. Combe issued an edition in Scotland, with numerous notes and comments.

The second edition was issued from Burlington, Vt., in 1847, with the same title page, but after Second Edition there are the words, Corrected by Samuel Beaumont, M. D., who was Dr. William Beaumont's cousin. In the preface to this edition the statement is made that the first edition, though a large one of 3,000 copies, had been exhausted. This does not agree with the statement made in a letter of December 3, 1833, to the Surgeon-General, stating that the edition was to be 1,000 copies. Of course more may have been printed before the type was distributed.

A German edition was issued in 1834 with the following title: "Neue Versuche und Beobachtungen ueber den Magensaft und die Physiologie der Verdauung, auf eine hochst merkwurdige Weise wahrend einer Reihe von 7 Jahren, an einen und demselben Subject angestellt." Beaumont's earlier paper, already referred to, was abstracted in the Magazin der auslandischen Litteratur der gesammten eilkunde, amburg, 1826, and also in the Archives generales de Medecine, Paris, 1828. I cannot find that there was a French edition of the work.

The "Experiments and Observations" attracted universal attention, both at home and abroad. The journals of the period contained very full accounts of the work, and within a few years the valuable additions to our

knowledge filtered into the text-books of physiology, which today in certain descriptions of the gastric juice and of the phenomena of digestion even the very language of the work is copied.

III. THE VALUE OF BEAUMONT'S OBSERVATIONS.

There had been other instances of artificial gastric fistula in man which had been made the subject of experimental study, but the case of St. Martin stands out from all others on account of the ability and care with which the experiments were conducted. As Dr. Combe says, the value of these experiments consists partly in the admirable opportunities for observation which Beaumont enjoyed, and partly in the candid and truth-seeking spirit in which all his inquiries seem to have been conducted. "It would be difficult to point out any observer who excels him in devotion to truth and freedom from the trammels of theory or prejudice. He tells plainly what he saw and leaves every one to draw his own inferences, or where he lays down conclusions he does so with a degree of modesty and fairness of which few perhaps in his circumstances would have been capable."

To appreciate the value of Beaumont's studies it is necessary to refer for a few moments to our knowledge of the physiology of digestion in the year 1832, the date of the publication. Take, for example, "The Work on Human Physiology" (published in the very year of the appearance of Beaumont's book), by Dunglison, a man of wide learning and thoroughly informed in the literature of the subject. The five or six old theories of stomach digestion, concoction, putrefaction, trituration, fermentation and maceration, are all discussed, and Wm. Hunter's pithy remark is quoted, "some physiologists will have it, that the stomach is a mill, others, that it is a fermenting vat, others, again, that it is a stew-pan; but, in my view of the matter, it is neither a mill, a fermenting vat nor a stew-pan; but a stomach, gentlemen, a stomach."

The theory of chemical solution is accepted. This had been placed on a sound basis by the experiments of Reamur, Spallanzani and Stevens, while the studies of Tiedemann and Gmelin and of Prout had done much to solve the problems of the chemistry of the juice. But very much uncertainty existed as to the phenomena occurring during digestion in the stomach, the precise mode of action of the juice, the nature of the juice itself and its action outside the body. On all these points the observations of Beaumont brought clearness and light where there had been previously the greatest obscurity.

The following may be regarded as the most important of the results of Beaumont's observations: First, the accuracy and completeness of description of the gastric juice itself. You will all recognize the following quotation, which has entered into the text-books and passes current today: "Pure gastric juice, when taken directly out of the stomach of a healthy adult, unmixed with any other fluid, save a portion of the mucus of the stomach with which it is most commonly and perhaps always combined, is a clear, transparent fluid; inodorous; a little saltish, and very perceptibly acid. Its taste, when applied to the tongue, is similar to this

mucilaginous water slightly acidulated with muriatic acid. It is readily diffusible in water, wine or spirits; slightly effervesces with alkalies; and is an effectual solvent of the *materia alimentaria.* It possesses the property of coagulating albumen, in an eminent degree; is powerfully antiseptic, checking the putrefaction of meat; and effectually restorative of healthy action, when applied to old, fetid sores and foul, ulcerating surfaces."

Secondly, the confirmation of the observation of Prout that the important acid of the gastric juice was the muriatic or hydrochloric. An analysis of St. Martin's gastric juice were made by Dunglison, at that time a professor in the University of Virginia, and by Benjamin Silliman of Yale, both of whom determined the presence of free hydrochloric acid. A specimen was sent to the distinguished Swedish chemist, Berzelius, whose report did not arrive in time to be included in the work. In a letter dated July 19, 1834, he writes to Professor Silliman that he had not been able to make a satisfactory analysis of the juice. The letter is published in *Silliman's Journal,* Vol. 27, July, 1835.

Thirdly, the recognition of the fact that the essential elements of the gastric juice and the mucus were separate secretions.

Fourthly, the establishment by direct observation of the profound influence on the secretion of the gastric juice and on digestion of mental disturbances.

Fifthly, a more accurate and fuller comparative study of the digestion in the stomach with digestion outside the body, confirming in a most elaborate series of experiments the older observations of Spallanzani and Stevens.

Sixthly, the refutation of many erroneous opinions relating to gastric digestion and the establishment of a number of minor points of great importance, such as, for instance, the rapid disappearance of water from the stomach through the pylorus, a point brought out by recent experiments, but insisted on and amply proven by Beaumont.

Seventhly, the first comprehensive and thorough study of the motions of the stomach, observations on which, indeed, are based the most of our present knowledge.

And lastly, a study of the digestibility of different articles of diet in the stomach, which remains today one of the most important contributions ever made to practical dietetics.

The greater rapidity with which solid food is digested, the injurious effects on the stomach of tea and coffee, when taken in excess, the pernicious influence of alcoholic drinks on the digestion, are constantly referred to. An all-important practical point insisted on by Beaumont needs emphatic reiteration to this generation: "The system requires much less than is generally supplied to it. The stomach disposes of a definite quantity. If more be taken than the actual wants of the economy require, the residue remains in the stomach and becomes a source of irritation and produces a consequent aberration of function, or passes into the lower bowel in an undigested state, and extends to them its deleterious influence. Dyspepsia is oftener the effect of over-eating and over-drinking than of any other cause."

In reality Beaumont anticipated some of the most recent studies in the physiology of digestion. Doubtless many of you have heard of Professor Pawlow's, of St. Petersburg, new work on the subject. It has been translated into German, and I see that an English edition is advertised. He has studied the gastric juice in an isolated pouch, ingeniously made at the fundus of the stomach of the dog, from which the juice could be obtained in a pure state. One of his results is the very first announced by Beaumont and confirmed by scores of observations on St. Martin, viz., that, as he says, "the gastric juice never appears to be accumulated in the cavity of the stomach while fasting." Pawlow has shown very clearly that there is a relation between the amount of food taken and the quantity of gastric juice secreted. Beaumont came to the same conclusion: "when aliment is received the juice is given in exact proportion to its requirements for solution." A third point on which Pawlow lays stress is the curve of secretion of the gastric juice, the manner in which it is poured out during digestion. The greatest secretion, he has shown, takes place in the earlier hours. On this point hear Beaumont: "It (the gastric juice) then begins to exude from the proper vessels and increases in proportion to the quantity of aliment naturally required and received." And again: "When a due and moderate supply of food has been received it is probable that the whole quantity of gastric juice for its complete solution is secreted and mixed with it in a short time." A fourth point, worked out beautifully by Pawlow, is the adaptation of the juice to the nature of the food, on which I do not see any reference by Beaumont, but there are no experiments more full than those in which he deals with the influence of exercise, weather and the emotions on the quantity of the juice secreted.

IV. MAN AND DOCTOR.

Sketches of Dr. Beaumont's life have appeared from time to time. There is a worthy memoir by Dr. T. Reyburn in the *St. Louis Medical and Surgical Journal*, 1854, and Dr. A. J. Steele, at the first annual commencement of the Beaumont Medical College, 1887, told well and graphically the story of his life. A few years ago Dr. Frank J. Lutz, of this city, sketched his life for the memorial meeting of the Michigan State Medical Society on the occasion of the dedication of a Beaumont monument.

Among the papers kindly sent to me by his daughter, Mrs. Keim, are many autobiographical materials, particularly relating to his early studies and to his work as a surgeon in the War of 1812. There is an excellent paper in the handwriting, it is said, of his son, giving a summary of the earlier period of his life. So far as I know this has not been published and I give it in full:

"Dr. William Beaumont was born in the town of Lebanon, Conn., on the 21st day of November, A. D. 1785. His father was a thriving farmer and an active politician of the proud old Jeffersonian school whose highest boast was his firm support and strict adherence to the honest principles he advocated. William was his third son who in the winter of 1806-7, in the 22d year of his age, prompted by a spirit of independence

and adventure, left the paternal roof to seek a fortune and a name. His outfit consisted of a horse and cutter, a barrel of cider, and one hundred dollars of hard-earned money. With this he started, laying his course northwardly, without any particular destination, Honor his rule of action, Truth his only landmark, and Trust placed implicitly in Heaven. Traversing the western part of Massachusetts and Vermont in the spring of 1807 he arrived at the little village of Champlain, N. Y., on the Canada frontier—an utter stranger, friendless and alone. But honesty of purpose and true energy invariably work good results. He soon gained the peo-

WILLIAM BEAUMONT.

ple's confidence and was entrusted with their village school, which he conducted about three years, devoting his leisure hours to the study of medical works from the library of Dr. Seth Pomeroy, his first patron. He then went over to St. Albans, Vt., where he entered the office of Dr. Benjamin Chandler and commenced a regular course of medical reading, which he followed for two years, gaining the utmost confidence and esteem of this kind preceptor and friends. About this time the War of 1812 commenced and he applied for an appointment in the U. S. Army, successfully. He was appointed assistant surgeon to the Sixth Infantry, and

joined his regiment at Plattsburgh, N. Y., on the 13th of September, 1812. On the 19th of March, 1813, he marched from Plattsburgh with the First Brigade, for Sackett's Harbor, where they arrived on the 27th inst. Here he remained in camp till the 22d of April, when he embarked with the troops on Lake Ontario.

His journal tells in an interesting manner the story of a short engagement in which the enemy lost nearly a third of their men and were soon compelled to quit the field, leaving their dead and wounded strewn in every direction Then they blew up their magazine, and Beaumont says: "Over 300 were wounded and 60 killed by stones of all dimensions falling, like a shower of hail, in the midst of our ranks. Distressing scene ensued in the hospital. Nothing is heard but the agonizing groans and supplications of the wounded and the dying. The surgeons wade in blood cutting off arms and legs and trepaning heads, while the poor sufferers cry, 'O, my God! Doctor, relieve me from this misery! I cannot live!' 'Twas enough to touch the veriest heart of steel and move the most relentless savage. Imagine the shocking scene, where fellow-beings lie mashed and mangled — legs and arms broken and sundered — heads and bodies bruised and mutilated to disfigurement! My deepest sympathies were roused—I cut and slashed for 36 hours without food or sleep."

In 1816 he settled in Plattsburgh and remained there four years in successful practice. In the meantime his army friends had persuaded him to join the service again, and, having applied, he was reappointed, in 1820, and ordered to Ft. Mackinac as post surgeon. At the end of the first year he obtained leave of absence, returned to Plattsburgh and married one of the most amiable and interesting ladies of that place. (She still survives her honored husband, and in her green old age is loved devotedly by all who know her.) He returned to Mackinac the same year, and in 1822 came in possession of Alexis St. Martin, the subject of his "Experiments on the Gastric Juice." By the accidental discharge of his gun, while hunting, St. Martin had dangerously wounded himself in the abdomen and came under the treatment of Dr. Beaumont, who healed the wound (in itself a triumph of skill almost unequaled) and in 1825 commenced a series of experiments, the results of which have been a world-wide publication. These experiments were continued, with various interruptions, for eight years, during which time he was ordered from post to post, now at Niagara, N. Y., anon as Green Bay, Mich., and finally at Fort Crawford, on the Mississippi. In 1834 he was ordered to St. Louis, where he remained in service till 1839, when he resigned. He then commenced service with the citizens of St. Louis, and from that time till the period of his last illness, enjoyed an extensive and distinguished practice, interrupted only by the base attacks of a few disgraceful and malicious knaves (self-deemed members of the medical profession) who sought to destroy a reputation which they could not share. They gained nothing except some little unenviable notoriety and they have skulked away like famished wolves, to die in their hiding places.

The dates of Beaumont's commissions in the army are as follows: Surgeon's Mate, Sixth Regiment of Infantry, December 2, 1812; Cavalry,

March 27, 1819; Post Surgeon, December 4, 1819; Surgeon First Regiment and Surgeon, November 6, 1826.

From the biographical sketches of Reyburn, Steele and Lutz, and from the personal reminiscences of his friends, Drs. J. B. Johnson, S. Pollak and Wm. McPheeters, who fortunately remains with you, full of years and honors, we gather a clearly-defined picture of the latter years of his life. It is that of a faithful, honest, hard-working practitioner, doing his duty to his patients, and working with zeal and ability for the best interests of the profession. The strong common sense which he exhibited in his experimental work made him a good physician and a trusty adviser in cases of surgery. Among his letters there are some interesting pictures of his life, particularly in his letters to his cousin, Dr. Samuel Beaumont.

He continued at work until March, 1853, when he had an accident—a fall while descending some steps. A few weeks later a carbuncle appeared on the neck, and proved fatal April 25. One who knew him well wrote the following estimate (quoted by Dr. F. J. Lutz in his sketch of Beaumont):

"He was gifted with strong natural powers, which working upon an extensive experience in life, resulted in a species of natural sagacity, which, as I suppose, as something peculiar in him, and not to be attained by any course of study. His temperament was ardent, but never got the better of his instructed and disciplined judgment, and whenever or however employed, he ever adopted the most judicious means for attaining ends that were always honorable. In the sick-room, he was a model of patience and kindness, his intuitive perceptions, guiding a pure benevolence, never failed to inspire confidence, and thus he belonged to that class of physicians whose very presence affords Nature a sensible relief."

You do well, citizens of St. Louis and members of our profession, to cherish the memory of William Beaumont. Alive you honored and rewarded him, and there is no reproach against you of neglected merit and talents unrecognized. The profession of the northern part of the State of Michigan has honored itself in erecting a monument to his memory near the scene of his disinterested labors in the cause of humanity and science. His name is linked with one of your educational institutions, and joined with that of a distinguished laborer in another field of practice. But he has a far higher honor than any you can give him here—the honor that can only come when the man and the opportunity meet—and match. Beaumont is the pioneer physiologist of this country, the first to make an important and enduring contribution to this science. His work remains a model of patient, persevering investigation, experiment and research, and the highest praise we can give him is to say that he lived up to and fulfilled the ideals with which he set out and which he expressed when he said: "Truth, like beauty, when 'unadorned, is adorned the most,' and, in prosecuting these experiments and enquiries, I believe I have been guided by its light."

The Advantage of Discipline to the Student of Medicine.

By F. Savary Pearce, M. D.,

PHILADELPHIA.

Professor of Nervous and Mental Diseases in the Medico-Chirurgical College of Philadelphia; Neurologist to the Philadelphia and Howard Hospitals.

Introductory Address at the Opening of Medico-Chirurgical College of Philadelphia, Oct. 1, 1902.

IT is my first pleasure on behalf of the Board of Trustees, the Faculties of Medicine, Dentistry and Pharmacy to welcome all our friends here, and especially our students back to work in the respective departments of the Medico-Chirurgical College; also to wish the new pupils success with us, a word that might well be made a motto for the school.

As to advice there is much that could be given each student—such an easy matter to give counsel! but I can not refrain from taking up one theme that has been uppermost in my mind since the Dean of the Faculty of Medicine notified me that I was to make the opening address.

Every student of the college I would without delay urge to seek diligently knowledge for information not merely for scholarship. Let your education here broaden the horizon of your intellect. And you must be on your guard! I gladly commend as an inspiration to stimulate those resolutions of achievement, which come to the ambitious at the first moment of the day, the following bit of verse clipped from somewhere and entitled "A Scholar's Prayer:"

"Light, light! O Lord, In darkness I was born
Yet strove against it ever. Many a star
Has faded quite and left me all forlorn;
But starward still I toil and follow far.
Thou didst create both darkness and the day.
O help, preserve me, though I blindly roam!
And if in love of light too wide I stray,
Shine in my heart, O God, and guide me home!"

A technical essay detailing the wonderful scientific advancement medicine has made I shall not, therefore, give you to-night, but instead will present some phases of the one pivotal point of true progress in any sphere of life and particularly for the student of medicine, i. e., discipline; which incorporated in any work will make toward the ideal: for as Schiller somewhere aptly says the physician "who can distinguish termologically and locally the coarse wheels of the intellectual clockwork, may be perhaps idolized by the mob, but he will never raise the Hippocratic art above the narrow sphere of a mere bread-earning craft."

Medicine is a hard master. The army of physicians and surgeons who wage war against disease and infection, and often stay the hand of death in the midst of his sombre triumphs, find theirs no easy task. Armed with scalpel and accoutred with the impediment of materia medica and pill-box, they fight a daily contest which is never recorded in the annals of the brave; but they can boast of a longer line of heroes than all the leigons of the conquerors. The soldier fights for fame, and if he dies on the battlefield his name is forever cherished on the roll of his country's

great. But the physician who falls before the insidious attack of infection or, worn-out by the wearisome round of crushing work falls a victim to his zeal, is never noticed in the nerve-racking, heart-shaking rush of our gigantic modern life.

This tremendous order of the mind in medicine began with the mythical Aesculapius, who was supposedly half god and half man, the son of Coronus and Apollo, and whose sons Podalirius and Machaon, were thought to be inspirers of the soldiery before the Trojan walls.

The medical man's has usually been a silent mission, but his triumph far excels that of the warrior in every feature of its unknown, unseen grandeur. The one triumphs in destroying life, the other wins a far greater triumph in saving life, ofttimes in the midst of the carnage the soldier has created. Or it may be a Jenner, who, trained in the discipline of observation, astounds the world by a wonderful cure or prevention of infectious disease. When that hero on May 14th, 1796, proclaimed that immunity from smallpox could be had by inoculation or vaccination from an animal or person through which the smallpox had passed, and thus became attenuated, it was the result of a long well ordered training.

What enables the practitioner to stick to the wearisome daily routine of work and worry and investiagtion? It is the discipline learned here in the clinic, laboratory and classroom. The discipline which both teacher and student often find irksome, but which if you stick to faithfully, will enable you to leave these halls at the end of your course equipped with something that riches cannot buy—the power of self-discipline, the power by which all men have climbed to greatness; the power to compel yourself to do things you do not wish to do. No exposition of this phase of the subject is better proven than in the life of Benjamin Franklin, who posed as no saint, but was not afraid to admit his faults. Every student should possess a volume of his "Autobiography," a little classic, in which discipline is clearly shown to be the chief cause of his many noble achievements.

Discipline and duty are two words which should stand side by side in the dictionary, for they are inseparable. Duty compels discipline and discipline upholds duty. We surely all of us want to do our duty, and that is a selfish reason why we should be well disciplined. It will uphold you in your later life, and you may be sure that duty will never be neglected for social frivolities if you are well-grounded in the rudiments of the soldier.

Hippocrates, justly called the "father of medicine," born on the Isle of Cos, in the Aegean Sea, was a stern-browed personage, who pondered and designed and then brought forth the richest treasures of learning. In the impetus given to treatment of disease, order was beginning to show even then.

It is a consoling thought that though the physician from the human nature of things seldom reaches the "Hall of Fame," has yet been the tutor of some who have reached that goal. Thus Alexander the Great was a student of Aristotle.

St. Luke was a physician who believed in order, as is written in the preface to his whole gospel when he says:

"Forasmuch as many have taken in a hand to set forth in order a declaration of those things which are most surely believed among us.

"Even as they delivered them unto us, which from the beginning were eye-witnesses, and ministers of the word;

"It seemed good to me also, having had perfect understanding of all things from the very first, to write unto thee in order, most excellent Theophilius,

"That thou mightest know the certainty of those things, wherein thou has been instructed."

Though much was superfluous it is interesting to note also that order and method permitted the vast amount, and some waste of labor, of the Grecian Galen born in A. D. 130, who wrote some five hundred volumes, the substance of which was in the discoveries in anatomical fields and therapeutics. Dioscorides and the Arabian Avicenna, the latter living in 1000 A. D. and known as the "prince of physicians," did by their very bearing towards order and truth aid in the dissipation of quackery.

And each one of us must continue to bear this burden!

By discipline I do no mean you shall stand at dress parade for a certain time each day, that you shall mount guard at dawn and even, or that you shall retire to the sound of "taps," or awake at the echoes of the "reveille." Your "reveille" shall be the call to the bedside of the sick, and "taps" shall come while you watch at dawn and see the first flush of returning health come back to the fading cheek.

By discipline I mean a *talent* for order, a nice appreciation of the value of hard work; know that there are many unpleasant things to do in life and that it is useless to shirk them. Of such qualities as these Julius Ceasar, Washington and Napoleon were made! Go at the anatomy, the physiology, the chemistry or other fundamental problems and you will conquer and know, and be strong because you have conquered—then on to the next difficulty which shall bar your progress.

The French anatomist Sylvius, born so long ago as 1493 A. D., by this steady course discovered a fissure in the brain around which modern studies have located important motor centres as they are termed, affection of which gives us definite symptoms in the diagnosis of brain disease. By the same regulated persistence, Columbus discovered America; and William Harvey discovered that the blood circulated over a century later.

The student should have hours for work and hours for play, but be sure you are playing for all you are worth while you do play, and that you are doing your best while you work. Never mix work and play. The Dutchman Boerhaave, born in 1668, and the Swiss Haller understood the value of this proportion, both leaving a great impress on medicine; the latter being characterized by Cuvier as "anatomist, botanist, poet, savant and man of knowledge universal."

Seek to be pure in body and pure in mind and the fruits of your drill will, after a while, begin to show themselves in a keener enjoyment of life, and you will find joy in the features of your *daily* life you never before were able to see because your senses were blunted. Train yourself constantly, drill your mind and body constantly; and there is no better way of doing so than by a faithful adherence to the curriculum of the college.

The studies of fever by Pringle, and the physical signs of disease of the chest through listening or auscultation by Avenbrugger and Laennec were the results of severe training. Pinel, who freed the insane from their chains, down to Charcot, who discovered a whole gamut of affections of the nervous system, were *disciplined;* the sanest of men! When you have well-trained yourself you are master of yourself, and then you can set out to master others.

The fight against tuberculosis in modern times, especially aided by Koch in Germany, who first discovered the bacterium that causes the disease; the finding of an antidote to rabies by Pasteur, or an antitoxin for diphtheria by Roux or Behring; the determination of the results of disease in the body, or pathology, by the late lamented Virchow; down to ascertaining the methods of preventing infection of wounds by Lord Lister, a boon to the surgeon on the battlefield, as elsewhere, were all greater still than those patriotic acts of bravery in the "man-of-arms" which have been going on ever since the world began!

Four years ago we threw down the gauntlet to one of the oldest empires of Europe. In an incredibly short time her empire was shattered and her colonies torn from her. The world waked up in amaze to find the American army and navy in such a splendid state of excellence from their daily drill; for after all the battles were not won by our ships or our cannon, but the "men behind the guns;" and they won because of the wonderful discipline and constant training which they had been subjected to in the "piping times of peace."

When the American army landed in Cuba and brought order out of chaos that reigned, it was largely done by the skill of one man, who though soldier was also a physician disciplined in the art of government. He has done a great work for the island, and did it because it was his duty, and because he upheld in his duty through the months of despair by discipline learned years ago in college. Under him worked a corps of physicians who suceeded in cleaning Cuba and installing there a splendid system of sanitation which has already saved thousands of lives. They risked their lives and many were killed by the typho-malarial fever with which they had becme infected while fighting for their country and humanity. They were upheld by the training of the universities and colleges and schools in which they had learned their craft. Such work as this, the result of strenuous effort for uplifting of mankind, can not be measured in gold, and is an example which only the perspective produced, by time will lend moral enchantment to; and deserves the expresison which Tasso alone could give to such wisdom—as is shown in the last verse of the L'Envoi to his epic "Jerusalem Delivered," as follows:

To him who lives as Wisdom would require,
As Duty woos, and as the Virtues claim,
Time if it robs the Poet of his Lyre,
Bestows a bliss beyond the wealth of fame,—
Fruits, that refresh the spirit, and inspire
Th immortal yearning, and that purer flame,
To quicken which, until they blend with heaven
The Mortal Poet and Lyre were given.

American industries have triumphed the world over. The commercial invasion of Europe is due to the executive heads back of it all, and Ameri-

can products excel because the producer, the American workman, is the best drilled, best disciplined in the world. In this way alone can doctor or mechanic get full value of his time, and order, and sequence; those things discipline is composed of. Thus every few minutes can be utilized for your advancement physically, mentally and morally. The physician gets nearer the home-life of the poeple than any other professional man, and this is a good reason why he should be well-disciplined, and lead a good life, that his influence on the family circle may be of the best

Let me caution you again as students not to adhere to your task too unremittingly. Breakdowns occur every now and then. Take up another branch when the mind becomes weary. This is the wisdom of conservative *versatility;* not vacillation. A physician of depth once told me that he always purchased gaited horses, that in the different movements certain muscles were largely put out of action. His horses certainly did keep up well in a large practice; the muscle burden was shifted through the mind of the rider; which can in turn discipline itself to the easing of brain wear and tear.

I wish to repeat that ancient and modern history universally teach us the value of care taking and orderly method. In Italy Cardan taught medicine in the sixteenth century, and with all the order then coming out of chaos there was more or less psychological muddle; for he was set down as doctor, philosopher and astrologer. But such men were, however, the advance leaders in the world of thought. At this transitional period also Lord Bacon was grinding into shape his "Advancement of Learning;" placing in order those known facts which are burned into the intellect of each succeeding generation. Apropos of this I could never understand why some critics will persist in the perversity of trying to give credit to Bacon for the broader intellectual cultured work of Shakespeare, who put the practical side of his knowledge to the fore; while Bacon was more of a great bookworm. The "Bard of Avon" had an orderly mind surmounted by the biggest nature.

And just this difference is what will make the practical physician as compared with the non-successful practitioner!

We have seen that in many lines the training as a student of medicine has produced great men. In letters also we can point to Oliver Wendell Holmes, whose "Autocrat" is a master-work full of happily expressed every-day observations of life that make it so sweet to us, and which makes his memory dear to the home. The vigorous Conan Doyle causes us to shudder betimes at his Sherlock Holmes stories and the "Hound of the Baskervilles;" but they savor of the truth gotten by training in medicine and psychology. In lighter vein his "Duette" shows up the delicate sentiment of the man himself. In the virile S. Weir Mitchell, Philadelphia, the medical centre of the United States, holds an exemplar for a career of general usefulness to humanity; a man disciplined as a student, as a practitioner at the bedside, an investigator into the poison of rattlesnakes, a pioneer in the establishment of neurology upon a firm advance, reinforced by studies of injuries of nerves during our Civil War, a great therapeutist, brought about by his common sense observation and atten-

tion to detail—and I doubt not Dr. Mitchell is happiest in this latter work. Finally he has won laurels in the field of general literature in "Hugh Wynne," describing well the times our Quaker City was occupied by the British during the Revolution; the best has been done.

The discipline of an hospital corps in the field of battle I have heard army surgeons say was one of the best equipments a medical man could have; and this is really more exactly similar to the training of the soldier that is possible in medicine. Still there is a different quality to the order, so to speak, for the successful physician in private; but none the less disciplined is he. One must learn early that nothing shall be slipshod, but he cannot take time to write out such detail regulation reports of his work as is incumbent in military or naval service, else he will stumble over himself before his next visit is made or the day is spent.

Learn to grasp essentials of scientific medicine and apply them to your patient for his welfare.

Then it will be known of you:

> He sees the "darkly" cleared away,
> And whist to accuracy he advancing clings
> Like the bee, the essence, transcendentally bring
> All legacies of thought to best guide his day.

As to cataloguing your case books, etc., after you have begun to practice, by all means do it, but most of your indexing of papers, literature and appointments had better be done in chronological order. Time is always with you. There is a discipline for one even in this fleeting reality. So I will not speak to you further!

And this is the message I bear you at the beginning of another school-year. Discipline yourself! And be of such make that unfaltering enthusiasm, persistent effort and unbending hope are all but a part of your birthright.

With discipline you can conquer the world, without it you cannot conquer the meanest temptation that crosses your path.

❦❦❦❦

For Nasal Catarrh (Internally(.—

℞ Quiniae glycero-phosph. pur..... gr. ½
Eucalyptoli benzoatis..... min. 1
Creosoti benzoatis..... min. 1

Mise fiat sec. artem. (dispense in capsule).

This prescription is sold under the registered name "kugloids" so-called after Dr. Kugler, author of this formula. Benzoate of creosote is tasteless and does not irritate the stomach, besides being free from all the untoward effects of other creosote preparations. These capsules are a specific in influenza when administered in the first stage, before the buccal cavity and bronchial tubes become infected.

Ligation of Arteries (Cocaine Anesthesia).

By B. Merrill Ricketts, Ph. B., M. D.

CINCINNATI.

Read before the Tri-State Medical Society, at Chicago, April 3, 1902.

A PLEA is herein offered for a more general use of cocaine for local anesthesia, especially for operations upon the head, neck and extremities. It should not only be more generally applied in those regions, but, on occasions demanding it, to parts of the trunk as well.

Its use has become better and more generally understood than any of the local or general anesthetics. It is certainly more efficacious, more desirable, and less dangerous. It has a wide scope of usefulness, while, as yet, it has been applied to but a limited degree.

Reference is made to its application to operations of any character on the extremities, and especially to its application in those involving the blood-vessels.

Indeed, there are but a few kinds of surgical operations that have not been done in a very satisfactory way with the local use of cocaine.

Cocaine anesthesia will not only permit of the ligaturing of the more important blood-vessels, but celiotomy for various purposes as well. The removal of the various *neoplasms, malignant and benign; plastic operations upon nerves, cutaneous, muscular and bony structures* in a healthy or pathologic state; removal of foreign bodies, or amputation of any part of the upper or lower extremities, are advised.

Amputation of the shoulder-joint has been successfully accomplished with cocaine as a local anesthetic by Crile, and while there is no recorded case for demonstration, there is no reason why even amputation at the *hip-joint* should not now be accomplished in this manner.

Since the injection of a solution of cocaine into the nerve-trunk or its sheath, or both (known as blocking), was advanced by Matas and Crile, a greater scope of usefulness is available. The blocking method prevents afferent impulses from reaching the central nervous system, and in this way shock is prevented. Crile's theory has shown this to be the cause of shock, and that injury or operation may excite afferent impulses to produce it.

Subcutaneous injection of cocaine was first practiced in 1884 (the year the drug was first placed on the market); since then much excellent work has been done with it, both subcutaneously and upon mucous membranes.

The effects of the remedy have become better known from experience and careful study, until now there can be no question as to its occupying a most prominent place, along with ether and chloroform, in surgical work. Cocaine should not be used in all surgical operations or kinds of operations; neither should ether, chloroform, nitrous oxide, or any of their combinations. There are cases that will necessitate the use of an anesthetic that will produce unconsciousness. Just so are there cases which

demand nothing more than a local anesthetic. The judgment of the operator must be relied upon in the selection of the anesthetic to be employed.

INDICATIONS.

The use of cocaine for operations is especially indicated in pulmonary, cardiac and renal diseases; also in case of exhaustion from any cause.

During unconsciousness emergency work may be accomplished by "blocking" the nerve trunk. In this way further shock may be prevented and much time saved. Then, too, subsequent excitement will be much less marked.

HEAD AND NECK.

The nerves supplying the head and neck, being so very inaccessible, offer but little opportunity for "blocking." Subcutaneous injections must, therefore, be resorted to. The external soft tissues of these regions may be subjected to operations by such injections without pain. This is also true of operations upon the mucous membranes, when local applications or subcutaneous injections are made separately or combined. The constitutional effects of a given amount injected in the head, face and neck are more marked than when injected in other parts of the body or extremities. This is due to two causes—more rapid absorption and its proximity to the brain. For this reason less cocaine should be used and the blood-vessels avoided.

Laryngototomy, laryngectomy and amputaton of the breast can and should be more frequently performed with the subcutaneous use of cocaine. Resection of one or more ribs can be accomplished with ease, and should be resorted to with cocaine in many conditons of the chest requiring surgical intervention.

The removal of blood, pus or serum from the pleural or pericardial cavity should, be done in this way. Pulmonary abscess, injuries to lung or heart, are made surgical by its use. It should not be applied to the heart-muscle itself, but to the pericardium and overlying tissues to be incised or sutured.

Any operation whatever may be made upon the shoulder or arm by injecting the brachial plexus, which is best reached through an incision intended for ligation of the subclavian artery. The artery may, if necessary, be ligated through the same incision which has been made for the subcutaneous injection of cocaine. The amount required for injecting the nerves need not exceed one drachm of a $\frac{1}{2}$ or a 1 per cent solution. This was the method employed by Crile in amputating at the shoulder-joint, which was so successfully accomplished, with recovery of patient.

For operations about and below the elbow a consideration of the musculo-cutaneous, median, ulnar and musculo-spiral nerves, one and all, must be given, the degree of anesthesia being proportionate to the number of nerves injected, and the thoroughness with which it is done. Only a few drops is required for each individual nerve.

LOWER EXTREMITY.

The injection of the external cutaneous is done with ease, it being superficial. The anterior crural should also be injected, together with the great sciatic.

"Blocking" of the *anterior crural* and *sciatic nerves* will produce sufficient anesthesia to make any operation below the point of puncture painless. This nerve is best reached at the lower and middle border of Poupart's ligament. It is more easily approached than any of the greater nerve trunks of the extremities, and for that reason it is probably best to inject it in all important operations that are to be made upon any part of the leg with cocaine anesthesia.

The *sciatic nerve* is best injected through an incision in the gluteal fold.

SCROTUM.

The ilio-inguinal and genito-crural nerves supply the scrotum and its contents. The first accompanies the spermatic cord through the inguinal ring to supply the integument of the upper thigh and scrotum in the male and the labium in the female. It varies in size, usually small, and connects with the ilio-hypogastric. When it does a branch of the ilio-hypogastric takes the place of the ilio-inguinal, or the latter may be altogether absent. In the second (genito-crural) the first branch passes through the internal ring to accompany the spermatic cord posteriorly to the cremaster muscle in the male and the round ligament to the female.

Injection of these nerves may be made in the same incision necessary for doing any surgical operation upon the scrotum or its contents. In this way 90 per cent of all operations upon the scrotum may be accomplished without pain or danger to life so far as the anesthesia is concerned.

ANEURISM.

Subcutaneous injections alone in and about the field of operation are all that is necessary to make ligation of arteries of the extremities painless. However, "blocking" the nerve trunk is most practical, and no doubt should be done as a rule. There is more or less pain in tightening the ligature about the artery in subcutaneous injections unless the sheath of the artery be also injected.

The use of local anesthesia is especially desirable in aneurism in the extremities.

METHOD.

A ½ to 1½ per cent solution of the best cocaine should be secured and the operator should know how to use it, and none other. An amount of solution containing from one-half to one and a half grains of cocaine need not be exceeded in performing any operation. Subcutaneous injections alone for operations will require more of the drug than where the injections are confined to the nerve trunks. The amount of cocaine necessary for the incision to reach a nerve trunk is but a trifle more than the amount necessary for injecting one or more nerves. If subcutaneous injections alone be resorted to for operations involving more than the cutaneous structures,

besides making deep primary injections, it will be necessary now and then to inject sensitive fascia or muscle, or both.

It is necessary in all cases where the bone is involved, necessitating attack, to inject the periosteum directly; that its sensibility may be overcome in this way the periosteum may be divided and retracted without pain or discomfort.

Subcutaneous injections alone are not so desirable for operations upon *bony structures* as "blocking," especially prolonged operations; such injections in the fingers and toes will make them senseless and permit of the bone being divided without pain.

Celiotomy may be made with the subcutaneous use of cocaine. In such cases it is well to inject the peritoneum also just before dividing it.

ADVANTAGES.

The danger of the drug is nothing if properly used, and it can be thus applied (a thing that cannot be said of ether, chloroform, nitrous oxide or any of their combinations). Nausea, vomiting, cephalalgia, nephritis, bronchitis, pneumonia and shock are *absolutely avcided.*

Crile says that injections into a nerve will not produce degenerations anywhere in its course, but that a needle puncture in the spinal cord will do so. This, together with a very high death-rate and uncertainty of anesthesia, should be sufficient to condemn spinal anesthesia. It would be just as rational to inject it into the cerebral arachnoid cavity.

DISCUSSION.

Dr. H. A. Leipziger (Burlington, Ia.): My experience in the use of cocain for surgical procedures is very limited. I must admit being very much edified and instructed by Dr. Ricketts' excellent paper, and should feel encouraged to make more use of the drug for this purpose than I have done before. I must say that my experience with cocaine in the so-called minor procedures has not been as sucessful as one might think might be the case. It may be due to imperfect technique in its use, or the cocain itself might not have been of a purity to obtain perfect absence of danger. Speaking of so-called minor surgical procedures, I believe that no surgical operation is minor any more, since we believe that bacteriological factors surround all surgical procedures, I am of the opinion that the term should be dropped. The cutting of an abscess in the periosteum of a finger, is as grave a surgical procedure as cutting off the leg, as far as the dangers of infection are concerned; consequently all operations are serious and are grave, and ought not to be classed as minor any more. I have had from the use of cocaine in these so-called minor operations, quite a little discomfort occasionally arise, and it has made me rather hesitate in its use where I could not circumscribe the absorption of the drug. That may have been the experience of a great many others, and I can't add anything to the value of the paper, nor detract from its excellence by any detailed reference. It may have been due to faulty administration, or to the non-purity of the drug used, but there have been some constitutional disturbances follow the use of the drug in this work, such as trou-

ble with the eyes lasting for a half or a whole day, flushing of the head equivalent in intensity to that following the use of chloroform and ether. I have not, however, seen any grave, or long-lasting serious results.

Dr. Flavel B. Tiffany (Kansas City, Mo.): I have been interested in Dr. Ricketts' paper. I have had some little experience in the use of cocain hypodermically, in practicing ophthalmology. I make nearly all my operations on the lid with its use and I use a little stronger solution than is mentioned in the paper of Dr. Ricketts; I use about 1 per cent. I almost always add to this adrenalin chlorid and after that I get no hemorrhage whatever. I have used it a great many times in plastic surgery, removing large skin grafts without any pain. In operating for entropion or ectropion for instance, where I use the electric cautery, I employ cocain hypodermically, without pain or any complications. I have never had any bad results from its use in this way. I have seen some disturbances from its use on the mucous membrane. I have enucleated the eyes several times by injecting the solution back of the eye and sometimes I inject it into the eye and then enucleate the eye with scarcely any pain.

Dr. Harold N. Moyer (Chicago): I am not sure that I know just what Dr. Ricketts' paper is about. It is labeled "Ligature of Arteries." Parenthetically, he throws in "cocain anesthesia." I notice that the discussion, at least, has been leveled at the parenthesis and not at the body of the paper. The whole question of cocain local anesthesia is still *sub judice*, and it will need more than the *ex cathedra* dictum of our friend Ricketts to settle it. Personally, I would rather take my chances in the hands of a good anesthetist, even with chloroform, preferably with ether, than have cocain injected into my spinal canal. With this new, or rather new-old system of blocking brought out by Crile, there is considerable that is interesting; namely, the injection of the larger nerve trunks so as to throw into the pathway of nervous impulse, a local anesthetic. It seems to lessen shock and the toxic effects are minimized. It is possible that in the surgery of the future, cocain anesthesia is going to have an important place. It is a promising field, but is still in its experimental stage. It must of necessity, be somewhat limited. The difficulty of reaching the nerve trunk, even a large one, is considerable.

In the infiltration method, according to Schleich, suppuration is common. It is only within the last year or two that solutions of cocain that are sterile, have been procurable. One would better rely upon a good manufacturer for a cocain solution than upon his own efforts to sterilize. Cocain, as is well known, loses its active properties by heat, and the cocain upon the market is subject to a great many impurities. I do not know today, where, in Chicago, an absolutely pure hydrochlorate of cocain could be obtained. Many of the untoward results in the spinal anesthesia are due to the impurities and the difficulties of sterilization.

Dr. B. M. Ricketts: In reply to the discussion, I would say that I only speak of spinal anesthesia to condemn it. It is the one thing that I have never done, the one thing that I have never had courage to do, fear-

ing a degeneration of the spinal cord following the introduction of the cocain. As to the use of adrenalin, I think there are some advantages to be obtained by combining it with cocain, but in the finer plastic surgery about the face and elsewhere, the very fact that it prevents hemorrhage is against it, because without vitality we do not get primary union. The subcutaneous injection of cocain and the system of "blocking," are two things, separate and distinct. I have amputated the thigh, the leg, the arm, the fore-arm, operated on the breast, performed herniotomies and operations on Hunter's canal with the use of cocain anesthesia. The toxic effect of the cocain in the "blocking" system, is nothing. You can take a one-half per cent solution of cocain and inject it into the nerve itself, and that is sufficient to produce anesthesia. I have injected it directly into the brachial plexus, using from two to five drops in each branch. It can be used in conjunction with ethyl chlorid.

It is so with the anterior crural nerve and with the sciatic nerve. It has been said here that cocain anesthesia is in its experimental state, but I am of the opinion that enough work has been done for us to arrive at some conclusions. I spoke of the importance of applying cocain to the heart muscle locally. I have done this in my experimental work upon the heart, but I am not yet prepared to say anything definite, except that it does have some effect upon the heart. I believe, however, that the preponderance of evidence of the experimental workers will be against the use of cocain injected into the heart for the purpose of suturing. I do not know that suturing of the heart is attended with any special pain. It has been done upon patients who have had no anesthetic at all and they made no complaint. From an experimental point of view, I would be a little cautious about using cocain in or on the heart muscle.

Against Bubonic Plague.—At a session of the Federal Council (Bundesrath) of the German Empire held July 13, 1902, stringent measures were adopted for combating plague The directions are divided into four headings: (1) Preventive measures; (2) obligation to report plague cases to the authorities; (3) investigations regarding the disease; (4) measures to be adopted to prevent the spread of plague. Preventive measures include the special inspection of dwellings when there is danger of an outbreak of plague, and prompt correction of all insanitary conditions; supervision by State officials of the drinking water; the destruction of rats, mice and other vermin; creation of sanitary commissions; introduction of steam disinfecting apparatus in all disinfecting stations; and the strict surveillance of all persons arriving from plague infected districts. Under the second heading is cited the persons who are held responsible for reporting plague cases and deaths therefrom to the proper authorities and also directions to police officials regarding the issuance of public notices calling attention to the duty of notifying authorities of plague cases. Under the third heading is found the necessary steps which must be taken by the health department when notified of the existence of plague; the ordering of post-mortem examinations; and the shipment of plague material. Under the fourth heading is included proper quarantining disinfection, isolation of plague patients, transportation, rates for the interment of those who have succumbed to the disease and various other regulations considered necessary to guard the public health.

Society Proceedings.

MISSISSIPPI VALLEY MEDICAL ASSOCIATION.

Proceedings of the Twenty-Eighth Annual Meeting, Held at Kansas City, Mo., October 15, 16 and 17, 1902.

STENOGRAPHICALLY REPORTED FOR THE MEDICAL FORTNIGHTLY.

[CONTINUED FROM PAGE 770.]

EXCELLENT RESULTS IN THE TREATMENT OF DISEASE, ESPECIALLY TUBERCULOSIS, BY THE USE OF THE ULTRA VIOLET RAY.

Dr. Albert E. Sterne, of Indianapolis, Ind., read this paper. He spoke of the division of the sun's rays, dwelling particularly upon the actinic or chemical rays of light, and the identity of those emitted from the voltaic arc with those of the solar planet. From this he had elaborated a method of treatment for which it was claimed that most excellent results had been attained, both in a general and local manner. The nude body was exposed to intense light from powerful voltaic arcs, and in addition free ozone was developed from a special ozonating apparatus. In local applications only one pole was used, and this was connected with vacuum tubes devised for different portions of the body to be treated.

Dr. Sterne claimed most excellent results in almost all conditions of debility, notably in neurasthenia, and in the primary stages of tuberculosis.

His conclusions are: (1) Actinic rays are chemical in their quality, but of small caloric value. (2) They exist mainly in the ultra-violet zone of the spectrum. (3) Actinic rays derived from high power electric lights are similar or identical to those of solar origin. (4) Their use is as rational as sunlight itself. (5) Their value lies in their decomposing, but, at the same time, reconstructive, molecular action upon the body tissues, mainly the blood elements. (6) Their activity is enhanced by the generation of ozone in free and nascent form. (7) Their ultimate effect is one of oxidation, and consequently they increase the metabolic changes, thereby augmenting the natural processes of regeneration within the system. (8) Their germicidal action is especially pronounced, on acount of the fact that germs can exist in the presence of free or nascent oxygen in either bi-or tri-anatomic form.

SANATORIUM TREATMENT OF PULMONARY TUBERCULOSIS, AND HOW IT MAY BE CARRIED OUT AT HOME.

Dr. Robert H. Babcock, of Chicago, discussed this phase of the subject. He divided the sanatorium treatment into four classes: Pure air, nourishment, or forced feeding, hydrotherapy, and a regime or control of the patients daily life.

The open air treatment was obtained by the patient being exposed on a balcony or in properly constructed shutters where he was protected from cold winds and elements, and kept in the open air sometimes even when the temperature was as low as 13° below zero. Among the conditions

which indicated rest in the open air were progressive loss of weight and cardiac asthenia. When patients had passed out of the stage in which these conditions existed, were convalescing, then exercise was permitted, the exercise being carefully determined by the medical attendant. The nourishment of the patient was carefully selected, not only with reference to a proper proportion of proteids, which should be large, but also included the proper amount of carbohydrates. Milk, raw eggs, meat, and its varieties, poultry and fish., were the articles on which reliance was placed.

Hydrotherapy played an important part in the treatment. Hydrotherapy was applied for the purpose of stimulating nutrition, toning up the circulatory system, and overcoming the hyper-sensitiveness of the skin, which existed in so many tuberculous patients.

As to the control of the patient, a very important element in treatment, every patient should be controlled from the time he got up in the morning until he went to bed, and this was done by the supervision of a skillful medical attendant and nurses. The temperature was carefully recorded, and even the recreations in which they indulged were carefully selected by the medical attendents, with a view to the prevention of excitement, for even mental emotion was deleterious to many of these patients.

Speaking of the home treatment of tuberculosis, Dr. Babcock detailed it at considerable length, saying that the majority of medical practitioners were not fully alive to the importance and value of this treatment, and were not properly instructed in the details of method.

TENT LIFE IN THE TREATMENT OF TUBERCULOSIS.

Dr. A. Mansfield Holmes, of Denver, Col., read a paper on this subject. He stated that pure air and sunshine were two important factors in effecting a cure of tuberculosis. Tent life was the most important means of securing the advantages of these factors. The author called attention to the essentials of an ideal tent cottage, and gave rules for governing tent life. Those who had had no experience with tent life invariably entertained an exaggerated idea of its dangers and inconveniences. A short experience soon dispelled this fear, and patients were with difficulty induced to return to an indoor life. Extended experience with tent life in Colorado justified him in making the following deductions: It increased the appetite; improved nutrition; diminished cough; night sweats ceased; sleep was improved; weight increased; fever decreased, and the tendency to take cold was diminished.

A model of the tent cottage adopted by the Rocky Mountain Industrial Sanatorium was exhibited, showing improved methods of construction and ventilation.

Dr. George F. Butler, of Alma, Mich., read a paper on

NEURASTHENIA.

Neurasthenia was the expresssion of nerve tire of the central nervous system and its consequences. Nerve tire of the central nervous system implied acceleration of the action of the excito-motor ganglia of the organ, with, first, increased functionating of these organs, and, second, exhaustion

with its consequences. In this way central nerve tire, finding expression along the line of least resistance, produced local organ expressions which were claimed as the cause of the constitutional condition. From these local expressions a vicious circle often resulted which aggravated the original condition. As over action of the organs implied under-elimination, auto-toxemia, of necessity, followed nerve tire, of a very poisonous type, like all products of nerve waste. From this, renal and hepatic disturbance was added to the clinical picture and intensified its blackness. Neurasthenia might occur alone, or might be an expression and complication of any constitutional disorder. In such case both the nerve tire and the constitutional disorder required treatment. The neurasthenia resultant on phthisis, nephritis, diabetes, and syphilis was a true neurasthenia which if not treated, intensified the disorder which gave it birth.

The treatment of neurasthenia consisted in the relief of the nerve tire and conditions underlying it through proper diet, hydrotherapy, balneo-therapy, relief of insomnia, and removal from an etiologic environment. Neurasthenia untreated might produce degenerate offspring, especially if the patient be a woman.

Dr John J. Taylor, of Streator, Ill., detailed a case of rheumatic neuritis, complicated by neurasthenia and other affections.

THE CRIMINAL RESPONSIBILITY OF THE EPILEPTIC.

Dr. John Punton, of Kansas City, Mo., in a paper on this subject gave a brief summary of historical data defining the line of demarkation between empiricism, on the one hand, and scientific knowledge, on the other, in reference to the study of epilepsy. A modern study of epilepsy was based upon the science of cerebral localization.

He drew the following deductions: (1) That epilepsy is a symptom of brain disease. (2) That its continual presence tends toward mental deterioration. (3) That the mental responsibility of the epileptic depends upon the extent to which mind or self-control has been impaired by the epilepsy. (4) That the legal test of insanity is not sufficient as mental irresponsibility in not incompatible with a knowledge of right from wrong. (5) The epileptics are to some degree, at least, responsible for criminal acts, more especially when the epilepsy is produced by their own default. (6) That criminal acts of epileptics appeal to medicine rather than law for their proper adjudication. (7) That in all cases of murder where epilepsy is proven, the law should be amended to allow of life commitment to an insane asylum rather than to a penitentiary. (8) That the mental responsibility of the epileptic in case of murder should be referred to a medical comission, appointed by the court, which again may be referred to local or county medical societies to name its members.

Dr. F. E. Coulter, of Omaha, Neb., read a paper entitled

SUDDEN ATROPHIC INFUENCE OF CRANIO-SPINAL NERVES.

He reported a case and described the areas involved. He also presented a report of normal and abnormal productions, mentioned the possible etiological factors in the case, cited other cases, and then summarized as

follows: Under certain conditions cranio-spinal nerves may exercise a sudden atrophic influence on the skin and the appendages thereof; that the results in the case reported were due to a disturbance of this nature, he thought he was warranted in concluding because of the following reasons: (1) All the hair was normal before the attack, but within three days after the attack all disappeared from the areas described. (2) The character of the new hair was such as would be the natural product of a faulty nutrition; if due to the production of a toxin or the sudden diminution of the normal elements, was difficult to decide. It was known, however, that the abnormal hair was smaller in size, length and diameter, and markedly deficient in pigment substance. (3) The fact that this was a bilateral lesion would naturaliy indicate that one was dealing with a blood condition, possibly a toxin formed by the very sudden and severe convulsive state and manifested itself on this particular nerve trunk because of some histological character in its composition that we, as yet, were unable to detect. (4) That in this particular case we did not have an example of that strange, yet interesting, condition of change in color, a discoloration of the hair seen after a very great fright or severe mental anguish, which in a short time changes the color of the hair completely, but instead a definite nutritive alteration, acute in character.

HEBEPHRENIA OR CHILDHOOD INSANITIES.

Dr. W. B. Fletcher, of Indianapolis, Ind., in a paper with this title, spoke of the causes, character, prevention and treatment of the various forms of insanity incident to children prior to and during the period of puberty. The writer had observed 300 cases of hebephrenia in the city in which he lived. He cited some interesting cases.

SYMPATHETIC EYE DISEASES.

Dr. James Moores Ball, of St. Louis, Mo., in a paper on this subject made a clinical division into sympathetic irritation and sympathetic ophthalmitis. He discussed the diagnosis, symptoms, etiology, prognosis and treatment of sympathetic irritation.

Speaking of sympathetic ophthalmitis, he said it was one of the most formidable and obscure of ocular affections. Only uveal inflammation which was caused by bacterial infection could produce this disease. He mentioned the date of appearance, frequency, symptoms, and divided the affection into uveitis serosa, sympathetic fibrinous uveitis, saying that the former was relatively mild, while the latter was a malignant affection. Sympathetic papilloretinitis, which rarely was the sole manifestation of sympathetic ophthalmitis, was likewise discussed. Other sympathetic affections had been described, without gaining recognition from ophthalmic authorities. He spoke at length on the prognosis of sympathetic affections, and then passed on to a consideration of the pathology and pathogenesis of sympahetic ophthalmitis, discussing the prophylaxis and treatment of these diseases.

Dr. J. W. Sherer, of Kansas City, Mo., followed with a paper on

TOXIC AMBLYOPIA.

He presented a clinical report of five cases of toxic amblyopia from methyl alcohol that had been seen by him. In all a degree of blindness rapidly followed drinking the poison. The eyes appeared normal externally, with pupils slightly dilated. The media were clear. There were no hemorrhages. Early there were no fundal signs, but later atrophy was visible. The fields were contracted and showed absolute central scotomata. One case was complicated by some involvement of the peripheral nerves of the lower limbs. The pupillary reaction corresponded to the description of Lauder-Brunton, who found it to be the reverse of the Argyll-Robertson reaction. Pathologically, the condition was that of peripheral neuritis affecting the optic nerves or retro-bulbar optic neuritis. Much work has been done by different observers to demonstrate experimentally the minute changes. Degeneration of the ganglion cells and macular layers of the retina occurred. This was partly due to vaso-constriction and diminished blood supply, and partly to the action of the poison. Consecutively, the nerve fibres degenerated. In the experiments with quinine, there was synchronously with the onset of the amblyopia chromolysis of the retinal cells, edema of the peri-cellular spaces, and wasting of the ganglion cells. In felicic neuritis it was found that all the nerve fibers had melted away by the fourth day. Undoubtedly, the primary affect was on the fibres, but the cells were probably simultaneously attacked. There was an analogy between the retro-bulbar neuritis of tobacco and alcohol and felicic neuritis, both being an acute parenchymatous neuritis.

BILATERAL GLAUCOMA.

A paper on this subject was presented by Dr. Flavel B. Tiffany, of Kansas City, Mo., in which he reported the case of a patient, upon whom he performed a double iridectomy.

Dr. T. D. Crothers of Hartford, Conn., read a paper on

DISEASES PRECEDING AND FOLLOWING THE USE OF ALCOHOL AND OPIUM.

The use of alcohol was regarded by the writer as one of the most subtle and serious causes of disease. Clinical study pointed out many distinct lines of disease which preceded inebriety, of which syphilis, trauma, dementia, and toxic states were most common. Neurasthenic conditions and tubercular diathesis preceded the use of spirits. Atrophic and hypertrophic sclerosis always followed, which preceded and emerged into inebriety, would enable one to practically prevent the disease.

TREATMENT OF TYPHOID FEVER WITH CASTOR OIL.

Dr. C. C. Bass, of Columbia, Miss., in a paper on this subject, reported thirty-two cases of this disease treated with castor oil, and except in a few cases, in which he gave some other medicine to meet some special symptom, he gave nothing else. Thirteen cases were treated with one dose every twenty-four hours, and nineteen cases with a dose every twelve hours. The results following the treatment were very gratifying. He commended this treatment as worthy of further investigation.

Dr. Henry G. Graham, of Chicago, Ill., followed with a paper on

CULTURE OF INFUSORIA.

He discussed the subject under the following heads: (1) Preserving the identity of the individval organism while growing it, (a) in running water; (b) in stagnant water. (2) Insolation of the organism. (a) By means of the petri dish; (b) by feeding to laboratory animals. (3) Transfer of elementary form of fluid culture media. (4) Second transfer of organism to fluid culture media more accessible to the atmospheric air. (5) Favoring growth of skeletal structure of protozoon at the expense of the liquid protoplasm.

His deductions were that culture of infusoria will show that (1) Muller's dust corpuscles are elementary infusoria. (2) The exceedingly minute and actively motile forms are derived from the protozoa.

[TO BE CONTINUED.]

THE MALTINE ESSAYS.—Our readers have felt considerable interest in the Maltine contest, and we are pleased to be able to give the result at this time. The first prize, $1000, went to Dr. W. W. Babcock, of Philadelphia, and the second, $500, to Dr. Lewis S. Somers, also of Philadelphia. Among the 209 essays submitted were five from Missouri and fifteen from Illinois; that the winners were not among these is simply a matter of excellence. The contest was a great success, and reflects great credit on the Maltine Company. We publish the report of the judges below:

BUFFALO, N. Y., October 18, 1902.

TO THE MALTINE COMPANY, New York.

Gentlemen:—Your committee selected to award the two prizes offered by your firm for essays on "Preventive Medicine," or some subject connected therewith, begs leave to report that the large number offered in the competition (being two hunderd and nine in all), and the general high grade of their excellence, has made the matter of selection very difficult. After critical examination and mature deliberation, however, your committee has awarded the first prize to the essay entitled "The General Principles of Preventive Medicine," signed "Alexine," and the second prize to the essay entitiled "The Medical Inspection of Schools, a Problem in Preventive Medicine," signed "Broad."

In submitting this report the committee congratulates you upon the widespread interest which you have aroused in the very important subject of Preventive Medicine, and it congratulates the medical profession and the public upon the great good that will follow the publication of the valuable addition to literature thus evoked by your enterprise.

Respectfully submitted.,

DANIEL LEWIS,
CHARLES A. L. REED,
JOHN EDWIN RHODES.
Committee.

MEDICAL MEMORANDA.

Winter Coughs.—It is in the chronically congested state of the bronchial, tracheal and pulmonary mucous membranes attended by hypersecretion of mucus, that Angier's petroleum emulsion is of special value. The expectoration becomes more free, the pulmonic congestion is relieved, the respiration is easier, the troublesome cough is checked. The sputum is altered, it becomes less viscid, more freely expectorated and loses its fetid and purulent character. The sensation of dryness and irritation in the throat and chest is relieved. Angier's petroleum emulsion is a natural sedative lubricant, which also adds vigor and tone to the system.

Modern Methods.—Progress in the treatment of diseases of women has kept pace with the advances made in general medicine. The physician who subjects a patient suffering from endometritis, vaginitis, leucorrhea, etc., to the disagreeable tamponing of the vagina with boro glyceride, etc., will find her leaving him for modern and up-to-date practitioners. Micajah's medicated uterine wafers are astringent, antiseptic and alterative, and when inserted into the vaginal canal up to the uterus, slowly disintegrate and offer a treatment for the above conditions which is most effective and satisfactory to the patient and doctor alike. No powder to spill nor water to soil the clothing. Write Micajah & Co., Warren, Pa., for samples.

Cocoa and Chocolate.—The value of chocolate and cocoa as adjuncts to the dietary of both the sick and the well is receiving considerable attention at the present time, the surprising thing is, that these nutritious and delicious products have so long been neglected for tea and coffee, which possess few virtues and produce many evil results. It is with all sincerity that we urge on the profession the wisdom of substitution generally and especially in all those cases where there is even slight derangement of the stomach or lower digestive tract. The more aggravated the condition the more urgency that tea and coffee be prohibited and none of the modern "health drinks" can compare with well prepared cocoa in their stead. Like all other foods, it is necessary to know how to prepare them before the best results can be obtained; to this end the Walter Baker & Co. issue a very valuable little booklet of choice recipes, which cover not only the use of cocoa and chocolate as beverages, but their other employment as well. This will be sent gratuitously to those making application.

A Notable Improvement in the Therapy of Typhoid Fever.—The recent discovery, by Duval and Bassett, of the presence of the bacillus dysenteriæ (Shiga) in forty cases of infantile summer diarrhea, awakens renewed interest in the subject of intestinal antisepsis. But a few months have elapsed since Drs. P. C. Freer and F. G. Novy, of the University of Michigan, demonstrated the enormous germicidal power of benzoyl-acetyl-peroxide, more familiarly known as acetozone. Although the preliminary reports of these investigators were of necessity based upon results of laboratory experiments, their expectations are already being realized in clinical work, in the treatment of typhoid fever particularly. In the city of Chicago, where a large number of cases of typhoid fever have been reported, acetozone has been used exclusively in the treatment of about 300 of them. The consensus of opinion is that it causes the temperature to de-

cline earlier than usual in the course of the disease, and it ameliorates the mental and physical condition of the patient, in all probability by controlling the toxemia. Two Chicago practitioners, I. A. Abt, M. D., and E. Lackner, M.D., have thus far reported (*Therapeutic Gazette*, October, 1902) forty cases of typhoid, in children, treated with acetozone, with but two deaths, a mortality of 5 per cent. One of the patients that died succumbed to pneumonia and pulmonary edema, the other to great pyrexia on the fifth day. Stupor and tympanites were almost entirely absent in all the cases; the characteristic fetor of the stools was markedly diminished, and the hemorrhage occurred but twice, and in the same case. The average duration of the febrile period, in 37 cases, after beginning acetozone treatment, was 13½ days. The drug did not seem to act upon the heart or respiratory apparatus. Early this year Eugene Wasdin, M.D., of the U. S. Marine Hospital Service, Buffalo, N.Y., reported 27 cases (*American Medicine*, February 8, 1902) of typhoid fever, 24 of which were treated with acetozone, all of the patients recovering. The writer says: "Its application in typhoid fever has been followed by very happy results; its use has been directed to the destruction of the germ in its primary lung colony and also in its secondary intestinal colony, and it has been used by hypodermoclysis to combat terminal expressions, with the result that in 24 cases the disease has been limited almost entirely to the expression of intoxication from the primary focus, the intestinal symptoms remaining entirely in abeyance, and the disease has been shorn of many of its disagreeable features." In a second paper, which appeared in the *Therapeutic Gazette* for May 15, 1902, the same writer states that his patients were given from 1500 to 2000 c.c. of the aqueous solution of acetozone daily. The diet was milk diluted with the same solution. The first influence of the drug is observed in the increased secretion of urine. That this is not due wholly to the ingestion of large quantities of water, necessitated by the use of the saturated solution is evidenced from the author's assertion that the same result was observed when acetozone was administered in capsules. The second influence to which attention is directed is the very pronounced decrease of the odor of the stools, while plate cultures from the dejecta showed comparatively few germs. The deodorant and diuretic effects of acetozone were also observed by G. H. Westinghouse, M.D., of Buffalo (Buffalo *Medical Journal*, August, 1902) who used it in seven cases. This observer remarks that with the increased flow of urine "a corresponding reduction of typhoid symptoms followed, and tympanites and delirium disappeared." It should be remarked that the diagnosis in all these cases, as well as in most of those reported by the Chicago physicians, was confirmed by Widal's reaction and Ehrlich's test, and in some a blood-count was resorted to. Westinghouse concludes his paper by saying that "acetozone, as an intestinal antiseptic, is unequaled by anything I have ever employed. A complete subsidence of all the bowel symptoms followed in every case of typhoid within a few days after beginning its use. The application of the antiseptic consisted, in most cases, in simply allowing the patient to drink the saturated aqueous solution *ad libitum;* or, in other words, substituting this solution for all other liquids, and urging the patient to partake of it freely when the natural craving was not sufficient to insure the consumption of considerable quantities."